

AMENDMENTS TO THE SPECIFICATION

Please replace the sixth full paragraph on page 4 with the following:

C1 Also, after the step (a-2-1), it is preferable to further include: (a-2-2) recording a ~~label~~
level corresponding to a direction having the greatest size in a direction map and a magnitude
map.

Please replace the first full paragraph on page 5 with the following:

C2 Also, it is preferable that the step (c-2) further includes: drawing out a list of beginning
and an end points of each line segment by connecting pixels having the same ~~label~~level in the
direction map, using a direction map having four directions.

Please replace the paragraph bridging pages 7 and 9 with the following:

C3 FIG. 1 is a flowchart illustrating the main steps of the shape descriptor extracting method
according to a preferred embodiment of the present invention. Referring to FIG. 1, in the shape
descriptor extracting method according to a preferred embodiment of the present invention, first,
an image is input (step 102), and a distance transform is performed on the input image to obtain a
distance map (step 104). The distance transform used to obtain the distance map uses a function
which indicates respective points within an objective as the shortest distance value from the
background. Next, a skeleton is extracted from the distance map (step 106). It is well-known
that a local maximum in the distance map is a point of a skeleton. The distance transform used
to obtain the distance map is based on a function which indicates respective points within an
objective as the shortest distance value from the background. In a preferred embodiment, the
local maximum in the distance map is determined as a skeleton by the distance transform. To
obtain the local maximum from the distance map, in a preferred embodiment, it is possible to use

C3 an edge detecting method which is used in "Linear Feature Extraction and Description" (R. Nevatia and K. R. Babu, Computer Graphics and Image Processing, Vol. 13, pp. 257-269, 1980), incorporated herein by reference. FIGS. 2A through 2D illustrate examples of a mask for detecting the local maximum. Referring to FIGS. 2A through 2D, masks for detecting the local maximum of four-directions are used for detecting the local maximum. FIG. 2A is a mask corresponding to the direction of 0 degrees. FIG. 2B is a mask corresponding to the direction of 45 degrees. FIG. 2C is a mask corresponding to the direction of 90 degrees. FIG. 2D is a mask corresponding to the direction of 135 degrees. Then, a convolution is performed using the masks. As a result, a label-level corresponding to the direction having the greatest size is recorded on a direction map and a magnitude map. Hereby, the local maximum is obtained on the distance map obtained by the distance transform from the binary image illustrated in FIG. 3A, so that the skeleton is extracted.
